What is Claimed is:

1. An assay for the detection of Lyme disease infection comprising contacting a sample to be tested with a recombinant P37 FlaA protein antigen, incubating for sufficient time to allow formation of specific antibody-P37 FlaA protein antigen complexes, and detecting specifically bound antibody-P37/FlaA protein antigen complex.

2. An assay as in claim 1 wherein said recombinant P37/FlaA protein antigen has the amino acid sequence of amino acids 1 319 of the amino acid sequence of SEQ ID NO 2.

3. An assay as in claim 2 wherein said recombinant P37 protein antigen is expressed as a fusion protein with a fusion partner.

4. An assay as in claim 3 wherein said fusion protein partner is the approximately 38kDa T7 gene 10 product.

5. An assay as in claim 1 wherein said P37 protein antigen is immobilized on a solid support.

6. An assay as in claim 1 wherein said P37 protein antigen is derivatized with a detectable label.

7. An assay as in claim 1 wherein said antibody-P37 antigen complex is detected by specific protein binding to the antibody specific for P37.

8. An assay as in claim 1 wherein said detection uses chemiluminescent labels, radioactive labels, or colorometric labels.

cultures comprising: constructing a DNA expression vector containing an expressible DNA encoding DNA sequence, transforming a suitable host cell with said expression

vector; preparing large scale cell cultures from freshly transformed host cells, and not overnight cultures; inducing FlaA protein expression from said host cells in culture; and isolating recombinant FlaA protein.

10. A method as in claim 9 wherein the recombinant FlaA protein has the amino acid sequence of amino acids 1-319 of SEQ ID NO 2.

11. A method as in claim 10 wherein the recombinant FlaA protein is expressed as a fusion protein with a fusion partner.

12. A method as in claim 11 wherein the fusion partner is the approximately 38 kDa T7 gene 10 product.

13. A method as in claim 5 wherein said host cell is an *E. coli* cell.

14. A recombinant FlaA produced using a method for producing recombinant FlaA protein from freshly transformed host cells comprising: constructing a DNA expression vector containing an expressible FlaA encoding DNA sequence; transforming a suitable host cell with said expression vector; plating out transformed host cells to generate individual fresh transformant colony of transformed host cells; preparing large scale primary cell cultures from transformed host cells taken from a fresh transformant colony, and not overnight cultures; allowing the primary cell culture to incubate for a period of time; inducing FlaA protein expression from said host cells in culture; and isolating recombinant FlaA protein.

15. A recombinant FlaA protein of claim 14, said protein having the amino acid sequence of amino acids 1-319 of SEQ ID NO 2.

protein is expressed as a fusion protein.

17. A recombinant FlaA protein as in claim 16 wherein the FlaA protein is expressed with a fusion partner that is the approximately 38 kDa T7 gene 10 product.

18. A recombinant FlaA protein as in claim 14 wherein said transformed host cell is an *E. coli* cell.